Role of the Operating Room Specialist in Orthopedic Surgery

Ortho Terminology

- Reduction- Realignment of broken bones into proper anatomical position.
- Immobilization- Stabilization of fracture site so healing can take place.
- Closed reduction- Manipulation and alignment of a fracture without an incision.
- Arthroplasty- Reconstructive surgery of a joint.

Ortho Terminology

- Chondromalacia- Softening of the cartilage.
- Goniometer- Instrument used to measure joint movement and angles.
- Parathesia- Abnormal sensation such as burning, tingling or numbness.
- Prosthesis- Artificial substitute for a missing body part.

Ortho Terminology

- Splint- Temporary device used to support or immobilize a limb.
- Traction- Pulling on a limb or a part of a limb.
- Osteomyelitis- Infection/inflammation of the bone.

Ortho Terminology

- Bone grafts- Bone used to replace missing bone or a bony defect (2 Types).
  - Autogenous- Taken from one part of the patient.
  - Homogenous- Taken from a cadaver.
- Circumferential- 360 degrees around.
- Osteotomy- Surgical cut into bone.
- Hallux valgus- Bunion

Major Bones of the Skeleton

- See figures:
  - 1 hip and leg.
  - 2 shoulder and arm.
  - 3 foot.
  - 4 hand.

Ortho Equipment

- Pneumatic tourniquet- Cuff placed around extremity to ensure an almost blood free field.
- Powered drills, saws and reamers:
  - Maxi driver- Used for large bones.
  - Mini driver- Used for small bones.
  - Sagittal saw- Saw blade that moves side to side.

Ortho Equipment

- Oscillating saw- Saw blade vibrates back and forth.
- Reciprocating saw- Saw blade moves forward and backward.
- Reamers- Drill used to enlarge the medullary canal of long bones.

- Power sources.
  - Compressed gases.
  - Electricity.
  - Batteries.

Ortho Equipment

- Fracture table- Table used for reductions, casting and Ortho surgery.
- Pulse lavage- Pulsating device used to irrigate wounds.
- Image intensifier- X-ray machine used to observe the movement and alignment of bones.
- Portable x-ray machine- Machine used to take single films.

Ortho Supplies

- Esmarch bandage- Elastic used to milk blood from an extremity.
  - Rods and nails.
- Implants- Devices used to stabilize or replace bones, joints or tendons.
  - Plates and screws.
  - Total joint components.
  - Pins and wires.
- Bone cement- Compound used to fix a prosthesis in place.

Ortho Instrument Sets

- Major Ortho set- Used mainly on large long bones.
- Minor Ortho set- Used mainly on small bone and soft tissue.
- Small bone set- Used on smaller bones such as the tibia, ulna and ankle.
- Knee set.
- Shoulder set.

Ortho Instrument Sets

- Amputation set.
- Fusion/ bone graft set- Instruments used to take an autograft.
- Total joint sets.

X-ray Considerations

- X-rays are used on most Ortho procedures.
- Sterile drapes will be required to drape c-arm and cassettes.
- Devices used to protect patient and staff.
  - Lead apron.
  - lead shield.
  - lead gloves.

Bunionectomy

- Rationale- Removal of the first metatarsal head to restore alignment of the big toe.
- Bunions may be due to heredity or structural defect in the foot.
- Anesthesia may be general or regional.
- Position is supine.
- Prep is circumferential, toes to thighs.

Bunionectomy

- Drapes- Extremity drape.
- Instrumentation:
  - Hand and foot set.
  - Micro sagittal saw.
  - Power wire driver.

Bunionectomy

- Sequence of events:
  - Incision is made over first metatarsal joint.
  - Joint capsule is exposed.
  - Excess bone or soft tissue is removed.
  - One third of the proximal phalanx is removed.
  - Wound is irrigated and closed.

Bunionectomy

- Wires may be used to maintain alignment.
- Dressings and bandages are applied.

Knee Arthroscopy

- Rationale- Injuries/ abnormalities within the joint.
  - Torn meniscus.
  - Torn ligaments.
  - Loose bodies.
  - Chondromalacia.
  - Damage from wear and tear.

Knee Arthroscopy

- Anesthesia may be spinal or general.
- Position is supine.
- Prep is circumferential from toes to thighs.
- Drape- Extremity drapes.
- Instrumentation.
  - Arthroscope

Knee Arthroscopy

- Arthroscopy set including:
  - Light cord.
  - sheaths and cannulas.
  - Trocars.
  - Probes/ hooks.
  - Arthroscopy scissors.
  - Grasping and biting forceps.

Knee Arthroscopy

- Equipment.
  - Video setup.
  - Irrigation pumps.
  - Arthroscopy suction.
- Special instruments for specific procedures.
  - Power shavers to trim cartilage and bone.
  - ACL set for ACL repair.

Knee Arthroscopy

- PCL set for PCL repair.
- Meniscal stitcher for repair of torn meniscus.

- Irrigating solutions- Normal saline or lactated ringers used to:
  - Expand the joint.
  - Keep the visual field free of blood.

Knee Arthroscopy

- Sequence of events :
  - Solution may be injected into the joint.
  - Inflow cannula is inserted and irrigation flow is started .
  - sharp trocar is inserted then replaced with a blunt obturator and the sheath is advanced into the joint.
  - Arthroscope is inserted and outflow tubing is connected.

Knee Arthroscopy

- The camera is attached to the scope.
- Problem is located and repaired using the appropriate instruments.
- The joint is thoroughly irrigated.
- Wounds are closed with nylon or vicryl.
- Local anesthetic may be injected.
- Gauze dressing, webril and ace bandages are applied.

Requirements of an Effective Cast

- Hold bones in alignment while healing.
- Must not be too loose or too tight.
- Signs that a cast may be too tight.
  - Swelling.
  - Numbness.
  - Discoloration.
  - Temperature.
  - Pain.

Requirements of an Effective Cast

- Casting materials.
  - Plaster of Paris.
  - Fiberglass.
- Padding materials.
  - Webril.
  - Stockinet.
  - Orthopedic felt.

Requirements of an Effective Cast

- Equipment for a cast removal.
  - Cast saw.
  - Cast spreader.
  - Bandage scissors.

Closed Reduction

- Indication- A fracture that can be reduced manually.
- Anesthesia is needed to prevent pain and relax skeletal muscles.
- No skin prep required.
- Sequence of events.
  - Patient is positioned by the surgeon.
  - Extremity is manipulated until fracture is reduced.

Complications of Ortho Surgery

- Infection requires the removal of all implants.
- Edema.
- Fracture non-union.
- Hemorrhage.
- Fat embolus.

Complications of Ortho Surgery

- Compartment syndrome- increased venous pressure caused by constriction of tissue, results in a lack of blood flow.
  - Compartments may require a fasciotomy (a surgical opening).
  - Nerves, soft tissue, vessels and muscles may necrose.

Complications of Ortho Surgery

- Implant breakage, loosening, wear, and mechanical complications.
- Bone necrosis- Fracture may disrupt blood supply to the bone.